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The earthy portion insoluble in muriatic acid had the following composition:—

		Atoms.	
Silica,	55·01	1·22	
Alumina,	5·35	0·10	
Protoxide of iron,	12·18	0·34	1·66
Lime,	3·41	0·12	
Magnesia,	24·03	1·20	
	99.98		

Omitting the alumina, the preceding analysis gives the rational formula of the Hornblende family

$$4RO, 3SiO_3;$$

and taken as a whole, it agrees with the analysis of many Hornblendes —the variety of Hornblende with which it has the closest relation is Anthophyllite.

According to Mr. Greg's catalogue of meteoric stones and irons, three other falls of aërolıths are recorded as having occurred in Ireland:—

a. A. D. 1779; at Pettiswood, Westmeath; 6 oz.
b. August, 1810; Tipperary; 7¾ lbs.
c. 10th Sept. 1813, Adare, Co. Limerick; 17 lbs. + 65lbs. + 24lbs. Moving E. to W. sp. gr. = 3.64.
d. 29th April, 1844, Killeter, Co. Tyrone; fragments of one stone sp. gr. = 3·761.

MONDAY, MAY 13, 1861.

The Very Rev. Dean Graves, D. D., President, in the Chair.

The Rev. William S. Burnside; Richard Hartley, Esq.; John Hatchell, Esq.; D. Toler, Esq.; T. Maunsell, M. D.; and the Rev. Henry Joy Tombe; were elected Members of the Academy.

Professor Hennessy, F. R. S., read a paper—

ON THE CONNEXION BETWEEN STORMS AND VERTICAL DISTURBANCES OF THE ATMOSPHERE.

Storms are now fully recognized to result from antecedent abnormal physical conditions of the atmosphere. The contact of unequally dense and elastic masses of air usually precedes every kind of storm. These disturbing conditions are themselves dependent chiefly on inequalities of temperature and dryness in the aërial strata. Were we able to observe these physical conditions simultaneously over a wide surface, and vertically in ascending over several points of an extensive district, we should be able to predict a coming storm from the observed conditions, quite as securely as a physician can prognosticate the ultimate results, by studying the symptoms of some well-known and frequently-recurring malady. But it is extremely difficult to observe the atmosphere in the manner thus indicated. The barometer presents manifestations of the physical state of the entire column of air situated vertically over it; and although such indications are limited in their character, they are those on which we are obliged principally to rely. Rapid changes in atmospheric pressure in any locality, as well as unequal simultaneous pressures in places but little apart, are now regarded as very frequent precursors of storms; but if we inquire into the causes of such inequalities of pressure, we shall find that other indications of atmospherical disturbances may be expected.

When two masses of air of unequal density are in contact, the tendency towards equilibrium will not be so immediate or so simple as most writers on the theory of winds appear to assume. Resisting forces of various kinds exist, among which some arise out of the friction of the currents among themselves, and against terrestrial objects; but the most important will result whenever it happens that the less dense mass of air possesses greater elasticity than the denser mass. Instable equilibrium may thus exist for a short time before either of the two masses could give way; but while such a state of comparative equilibrium temporarily subsists between the two great masses, minor disturbances will arise wherever their strata came into immediate contact. The mingling of the heterogeneous strata will take place, as in all fluids, by a process of convection.

I have already shown the important influence exercised by this process in the mode of heating of the atmosphere, and I have attempted to point out its relations with the most ordinary horizontal and vertical movements of the air.* In order to observe such movements, I devised a species of vane, which shows the existence of an upward or downward motion in the air, as well as the horizontal direction of the wind. When the air is still, or moving parallel to the earth's surface, the vane shows no upward or downward inclination. In the presence of two great heterogeneous masses of air, yet in a state of instable equilibrium, we would usually not have any indications of the convections of their particles, except the occasional ascent of light objects from the ground, or the sudden indraught of smoke in chimneys. But such phenomena are necessarily vague. If we are entitled to assume that much vertical convection of the air, with comparatively little horizontal motion, foreshadows an approaching disturbance, it follows that a better mode of observing vertical currents is desirable. During the three winter months, I have been occasionally observing vertical currents of the atmosphere, with the aid of such a vane; my observations have not been made at fixed hours, nor on every day; but they have usually arisen whenever abnormal disturbances occurred. As a general rule, I have found that most of the storms which we experienced during the past winter have been preceded by violent vertical movements of the atmosphere. In most of those cases, downward currents appeared to prevail. During the fine weather at the close of January, I observed so little of vertical currents, that I laid aside my journal; but on the two days preceding the disastrous storm of Saturday, February 9, some circumstances attracted my attention, and induced me to resume my observations. On the 7th, I observed, at about 4 P. M., in a part of a wide street, bordered only by a wall, a gentleman's hat lifted off his head to a height of at least five feet. The hat dropped back again, without being transferred horizontally to any appreciable extent. On Friday, the 8th, at 2 in the afternoon, my attention was called to the anemoscope, by its shifting round, through N., towards N. E., with decided and frequent downward plunges. It appeared as if showers of cold air were descending;* the temperature was also falling. At this time the horizontal motion of the air was comparatively little, while the vertical convection was apparently highly developed. Next day, during the storm, the disk of the vane was in a state of constant oscillation; but no marked prevalence of upward or downward motions could be observed, and nothing resembling the plunges noticed on the preceding day.

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* "Reports of the British Association for 1858;" "Atlantis," No.V.; and "Philosophical Magazine" for May, 1860.

Although we should scarcely expect to be able to observe the influence of such disturbances in a mercurial barometer, they may become manifest, were we to use a liquid column of much greater height.† During the short period that a column of water was so employed by Professor Daniell at the apartments of the Royal Society, he appears to have noticed numerous and rapid oscillations during storms. The diminution of such oscillations, both in frequency and intensity, enabled him to predict the approach of fine weather. During windy weather, the regular and continuous motion of the water-column resembled the action of respiration. This remark corresponds with what I have stated, both here and elsewhere, as to the oscillations of the anemoscope during gales of wind. The inference which I drew from the comparative regularity of such oscillations is, not that vertical currents prevail with strong winds, but that the motion of the air is essentially undulatory. The irregular and plunging motions of the air observed by me before storms, and sometimes even before rain, are essentially different phenomena, and they do not appear to have been noticed by Mr. Daniell in any of the appearances exhibited by his water-barometer.

One of the most remarkable phenomena connected with the storm of the 9th February was the rise of the barometer a short time before its commencement. A fall had taken place at a preceding period; and, in accordance with the usual empirical rules, the rise would be considered as showing the approach of fine weather; but when this rise was accompanied by northerly and easterly winds, and when the air at the surface of the earth was becoming mingled with cooler particles descending from above, it is manifest that the increased pressure was due to the increase of density of the entire aërial column over the barometer resulting from these influences. Thus the change from a high to a low density of the air was necessarily accompanied by convection between the warmer and cooler strata, as exhibited by the anemoscope.

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* Dove refers to the precipitation of cold air during whirlwinds, and to the storm assuming the form called by the Greeks *εκνεφίας*.—"Board of Trade Meteorological Papers," No. III., p. 22; and "Taylor's Scientific Memoirs," vol. iii., p. 215.

† In extraordinary cases the mercurial barometer has always exhibited such fluctuations: thus Dove refers to a remark of Hoskiaer, that during the great hurricane of August, 1837, at St. Thomas, the mercury sank two lines at each gust, and then immediately rose to the same height as before.

Before, as well as during north-easterly storms, we may thus expect precipitation of cold air downwards, and ascent of warm air upwards. During a gale it becomes difficult to distinguish these phenomena from the merely oscillatory movements impressed upon the lower strata of the atmosphere by the influence of terrestrial impediments. When a shallow current of water passes over a rough bottom, it assumes a ridged surface. If we superimpose additional water, the surface of the current will become gradually smooth, and it may ultimately present no sensible inequality, as on the surface of a deep stream; but we cannot conclude that the oscillatory action of the particles near the bottom has been entirely extinguished. The influence of the obstacles upon the motion of the current will decrease in approaching the surface, and increase in approaching the bottom.

Thus horizontal currents of air, close to the earth's surface, are necessarily disturbed by the presence of trees, buildings, and other obstacles, and in this manner they may influence the movements of a vertical vane precisely in the way that has been observed. During a storm an observed diminution of vertical oscillations of the vane will result from diminished violence of the wind, just as the gradual lessening of the movements of the water-barometer seemed to Professor Daniell to foreshadow the cessation of a gale. During comparatively calm weather, very energetic vertical movements of the atmosphere may be safely grouped among the most certain symptoms of approaching disturbances on a grander scale.

Professor Hennessy read a paper "On Anonymous Publications."

The REV. SAMUEL HAUGHTON, F. R. S., Fellow of Trinity College, Dublin, read a paper—

ON THE TIME OF HIGH WATER IN DUBLIN BAY, ON GOOD FRIDAY, THE 23RD APRIL, 1014, THE DAY OF THE BATTLE OF CLONTARF.

SOME time ago I was asked by the Rev. Dr. Todd to calculate for him the time of occurrence of high water, on the 23rd April, 1014, the day of the battle of Clontarf; as he believed that such calculation would throw important light on the accounts that exist of that famous battle.

The following is a brief account of the calculation and of its result. This result confirms in a remarkable manner the ancient account of the battle, with which I was unacquainted previous to making known to Dr. Todd the solution I had arrived at. I believe that, in consequence of the exact information obtained by the Academy in 1851 of the Irish